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GEOGRAPHIC VARIATION IN THE AFRICAN SCOPS OWL

By James P. Chapin

The opinion has often been expressed in recent years that *Otus senegalensis* (Swainson)[1] is so extremely variable—within any given area—that it is almost hopeless to attempt to divide it in geographic races. Two island races were admitted by Mr. Sclater,[2] but he did not feel justified in recognizing any of the subdivisions proposed for the birds of the African continent. Dr. Hartert[3] has likewise written: "I doubt if any subspecies of *O. senegalensis* can be separated, and am inclined to believe that *latipennis* . . . , *pygmea* . . . , *ugandæ* . . . , and *hendersoni* . . . are all the same."

A similar conclusion had been arrived at by Claude Grant,[4] who said that individual variation was too great to permit of separating geographic races. He thought there were three phases of plumage: gray, rufous, and slaty-gray. Ogilvie-Grant[5] likewise favored an explanation based upon color-phases.

An examination of the British Museum series might seem to justify such views, for in 1921, when I had an opportunity to study it, scarcely four skins could be found that looked alike in the collection of about fifty. On further investigation, however, it became clear that there was no satisfactory representation from any one locality. A few of the older specimens were without accurate data, or perhaps erroneously labeled; and one became impressed with the need of more extensive collecting. My own field experience leads me to believe that while in some regions the amount of rufous in the plumage must be variable, there are, nevertheless, good grounds for recognizing a number of subspecies. At least, I am sure that within the borders of the Belgian Congo geographic differences are far more pronounced than individual variation. No owls of this species live in the rain forests of the Congo, but they do occur in fair numbers in the savannas of the north, east, and

[1] *Scops capensis* Smith, 1834, cannot be used as the specific name because in 1837 Smith proposed *Otus capensis* to designate the South African marsh-owl.
[2] 1924, 'Syst. Avium Ethiop.,' part 1, p. 241.
[3] 1924, Novit. Zoöl., XXXI, p. 18.
[4] 1915, Ibis, pp. 253, 254.
[5] 1912, Ibis, p. 400.

south. Birds from the Uelle District and the Katanga are readily distinguishable.

The Northern Congo

About Faradje (Upper Uelle District), from 1911 to 1913, I made a special search and secured seven males and a female. In coloration they are all surprisingly alike, allowing for a slight variation in the width of dark streaks on the breast, or the exact amount of rufous in the plumage. None is so light gray as many specimens coming from drier areas of the continent, nor is any prevailingly rufous. In this series there are no color-phases.

These birds from the Uelle answered the description of *O. s. ugandæ* (Neumann); and, when I had the opportunity of comparing a couple of them with Neumann's types in the Berlin Museum, the agreement was found to be close. Since then I have collected two males at Sikiro, near Jinja, Uganda. They are virtually topotypes of *ugandæ*, and fit right in with the small series from Faradje. Three specimens in the British Museum from the intervening area (a pair from Wadelai, and a male from Yei which may be immature) are similar enough to be included in *ugandæ*, as is also a female from Mulema, Ankole. A male in the U. S. National Museum from Rhino Camp, on the Bahr-el-Jebel, may likewise be referred to *ugandæ*, though it has a little more rufous on the middle of crown and back, and a little less dusky vermiculation on breast-feathers, than our skins from the Uelle and Uganda. I have seen no markedly rufous individual from the area mentioned above, and I believe *O. s. ugandæ* to be distinctly stable in coloration.

Upper Guinea Savannas and Sudan

It is desirable to know, of course, in what way *ugandæ* differs from typical *senegalensis*. Eight skins in the British Museum from Senegal, Gambia, Bathurst, and Accra, average grayer above than *ugandæ*, and rather duller below, the white areas on breast-feathers less conspicuous, yet some of them do show light rufous patches on the breast-feathers. These rufous markings were emphasized in the original description of *ugandæ*, but are perhaps not the most important character. Neither are the types of *ugandæ* so largely rufous as Professor Neumann's description might be taken to indicate. One male specimen of *senegalensis* from the vicinity of Bauchi, Nigeria (B. Alexander), is lighter and grayer than *ugandæ* and lacks distinct rufous marks on the breast. Another, without sex, from Illorin, Nigeria, is more rufous above, with light rufous

marks on breast, but has less pronounced dark markings than *ugandæ*. A single male in the Cleveland Museum from Thiés, Senegal, is rather rufous, especially on the middle portion of the breast-feathers, but more generously flecked with white on the upperparts than *ugandæ*. It is evident that in typical *senegalensis* the amount of rufous coloring is variable; but there is no "slaty-gray" phase.

Whether typical *senegalensis* ranges eastward as far as Nigeria and northern Cameroon I shall not attempt to prove. More specimens are needed from small areas before the extent of individual variation can be appreciated. Specimens from the Bahr-el-Ghazal and Sennar are mostly lighter and grayer than *ugandæ*. They seem to be more variable, yet they never quite match the surprisingly stable *ugandæ*.

On the Blue Nile, Phillips and Allen[1] obtained three, of which two are gray and the third markedly rufous. Yet the more reddish individual has about the same black streaking and gray vermiculation as the others. From the same region Madarász (1912) described a very pale gray individual with wing 126 mm. as *Scops königseggi*, but the name must be synonymous with *Scops pygmea* Brehm (1855) from Sennar. Neither is it sure that *pygmeus* is separable from the Senegal race.

Northeastern Africa

In northeast Africa there seems to be a valid race with very heavy vermiculation. One of the darkest skins I saw in the British Museum—if not the extreme in this direction—was a female from Undel Wells, northern Abyssinia (Jesse). Its crown and back are dark gray with blackish markings, but with very little rufous. Under surface with well-marked black shaft-streaks, and the rest of the exposed portion of the feathers so generously and thickly vermiculated with blackish that the general tone is unusually darkened. Bases of breast-feathers have some light rufous color, but this is almost entirely concealed.

A second specimen of similar color is labeled "Damaraland." This may well be erroneous, as there is no original collector's label, and the bird was acquired by the British Museum from the Tweedale Collection, together with the example from Undel Wells. A third individual with similar vermiculation, but general color not quite so dark, came from the Orr Valley, British East Africa (A. B. Percival).

In the U. S. National Museum there are three heavily vermiculated specimens from Dire Dawa and Sadi Malka, Abyssinia; and a male in the Museum of Comparative Zoölogy, Cambridge, from the Northern

[1] 1913, Bull. Mus. Comp. Zoöl., LVIII, No. 1, p. 9.

Guaso Nyiro, Kenya Colony (G. M. Allen), is fairly close to the Abyssinian birds. These have recently been described as *O. s. cæcus* by Dr. H. Friedmann; and I am convinced of the validity of this subspecies.

The pair collected by Elliot[1] at Daboije, Somaliland, is of dark color, generously vermiculated, and with light rufous marks on bases of breast-feathers. The male has heavier streaks, above and below, than the female, otherwise they are much alike. Comparison with Dr. Mearns' Abyssinian specimens shows them to be referable to *cæcus*, although not quite so dark as the type of that race.

Eastern Congo

Scops owls occur in some of the grasslands along the eastern Congo border, and I have heard them calling at night in the upper Semliki Valley and the Rutshuru Plain. The Congo Museum has a female labeled "Ruzizi-Kivu" which may well be referred to *ugandæ* by its coloration. It seems almost certain that this race extends southward about to Lake Kivu.

At the northern end of Lake Tanganyika, and probably also in the Ruzizi Valley, *O. s. ugandæ* is replaced by another form, of which I have examined four specimens, all from the vicinity of Baraka. Two of these, in the Vienna Museum, collected by Rudolf Grauer, have already been mentioned by Dr. Sassi[2] as differing from the Berlin specimens of *ugandæ* in having less rufous on the underparts, but more cinnamon or rufous color above, so that he thought they might agree with *O. s. pusillus* Gunning and Roberts, of Boror, Portuguese East Africa.

According to the original description, however, and to judge from a specimen from Beira in the British Museum, *pusillus* is a far more rufous race than the birds of Baraka. The Congo Museum also has a specimen collected at Baraka by Pauwels, and I have obtained one at Lueba, just north of Baraka. These four males are all very much alike, and are readily distinguished from both *ugandæ* and *hendersoni*, the latter being known from the Katanga as well as Angola. I shall therefore name them in honor of Rudolf Grauer.

Otus senegalensis graueri, new subspecies

Subspecific Characters.—Similar to *O. s. ugandæ*, but the rufous markings on the basal half of breast-feathers paler and less extensive, while the crown, nape, back, rump, and lesser wing-coverts are more heavily washed with rufous. Wing shorter, 127–130 mm.; tail, 58–60 mm.

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[1] 1897, Field Columbian Mus., Ornithology I, No. 2, p. 56.
[2] 1912, Annalen Naturhist. Hofmus., Wien, XXVI, p. 361.

TYPE.—Male adult; Lueba on northwest shore of Lake Tanganyika; July 25, 1927; A. M. N. H. No. 262638. Wing, 130 mm.; tail, 58 mm.

It may be expected that the same race will be found in the interior of Tanganyika Territory. A female collected by Loveridge at Morogoro and now in the Museum of Comparative Zoölogy is very similar in color to specimens of *graueri* from near the type locality, but its wing measures only 119 mm. Other specimens from Tanganyika Territory are grayer.

EASTERN AFRICA

In the highlands of Kenya Colony the African scops owl seems to be relatively scarce. Probably it is more common near the coast, and in northern Tanganyika Territory it is numerous and often heard calling at night. I have not examined many examples from this region, but some of the specimens are decidedly gray. A male in the Berlin Museum from Ukerewe Island, on the southeast side of Lake Victoria, is of a much grayer color than *ugandæ*, especially beneath. A male from the Mkata River, Tanganyika Territory, in the Museum of Comparative Zoölogy, is unusually light and gray, but may be immature. Another grayish specimen, a male, was taken by Messrs. Rockefeller and Murphy near Mbulu, Tanganyika Territory; and Mr. F. G. Carnochan secured a gray male, with a little more rufous on crown, back, and wing-coverts, 30 miles south of Tabora. These gray specimens from Tanganyika Territory have very whitish tarsal feathering, with only faint streaking. That some rather rufous specimens, resembling *O. s. graueri*, also occur in Tanganyika Territory, has been pointed out above. Whether or not it is simply a case of individual variation remains to be determined. The maximum wing-length in Tanganyika Territory is 130 mm.

SOUTHERN CONGO AND ANGOLA

There is no doubt as to the distinctness of *graueri* from *hendersoni*, which occurs in the Upper Katanga as well as in Angola. The type and cotype of *hendersoni* in the Philadelphia Academy are more uniformly grayish than *ugandæ*, with smaller blackish markings on the upperparts. There are only pale cinnamon markings on the basal part of breast-feathers. There is another specimen in the American Museum collected by Lang at Chitau in central Angola, which agrees with the type of *hendersoni*. The grayer character of *hendersoni* is due largely to fine vermiculation. But it is not such a light gray coloration, nor so much varied with whitish, as in the gray specimens of eastern Africa. A skin in the British Museum from Ndala Tando, Angola (Ansorge), shows the

same gray appearance of *hendersoni*. The British Museum has also two skins of Neave's from the Katanga and two from the Loangwa Valley, which are less rufous than *ugandæ*, and are to be referred to *hendersoni*.

Needless to say, I have not been able to make direct comparisons between all these birds, but am writing from notes made by using two of my skins of *ugandæ* as a standard. I believe I have good reason to state that in and near the Belgian Congo *ugandæ*, *graueri*, and *hendersoni* show but little variability and no distinct color-phases.

I do not claim that such is the case for other forms in the Sudan or eastern Africa. I can point out that in some regions, as on the Blue Nile, and possibly Tanganyika Territory—both drier regions than the Congo border—one does find both gray and moderately rufous individuals. More intensive study, on the spot, would be likely to settle their status. It is not to be expected that faunal divisions follow the political boundaries, and it is always possible that in some regions variability in color is greater than in the Congo.

Southern Africa

Claude Grant's remarks may well be considered again, with reference to the races that have been proposed for South Africa. Gunning and Roberts[1] had previously recognized four subspecies in South Africa, three of which they described as new. These Grant regarded as untenable; but he also listed among the supposed races *Otus leucopsis* (Hartlaub) and *Otus icterorhynchus* (Shelley), so it does not seem as though he examined his specimens very critically.

Austin Roberts[2] replied with a strong defense of the four South African races. So far as his material went, twenty specimens in all, the scops owls of a given district were uniformly colored. Of one form, *O. s. intermedius*, he had thirteen examples from the Transvaal. To a certain extent, Mr. Roberts' contention is borne out by material in the British Museum. The type of *Scops capensis* Smith, supposedly from Cape Province, is very dark and brownish on crown, back, and tail, with a light wash of rufous on the tail. Rather broad stripes on breast, but little cross-barring or vermiculation there. This is not unlike the description given by Roberts (1911) for two adults from Grahamstown. I am well aware that there is another old specimen in the British Museum now labeled "Cape of Good Hope" but decidedly rufous in color. Examina-

[1] 1911, Annals Transvaal Mus., III, p. 111.
[2] 1917, Annals Transvaal Mus., V, p. 247.

tion of the British Museum register shows, however, that it was originally entered as "*Scops senegalensis*" without locality, so its real origin is doubtful. It is to be regretted that the name *latipennis* must replace *capensis* for this southernmost subdivision of the species.

From Boror, Portuguese East Africa, Gunning and Roberts described *O. s. pusillus* as "whiter on the abdominal region. . . . general effect gray suffused with fiery yellowish to chestnut; tail gray, washed with rufous. . . . Wing, 127–129." At the British Museum I saw a specimen collected by Claude Grant at Beira, Portuguese East Africa, which was quite exceptional in its light rufous coloration, with wing 126 mm. It must be admitted that this example agrees in color with *pusillus*. On the other hand, Grant's gray specimen from Klein Letaba, Transvaal, may represent *intermedius*, as Roberts claimed. Its wing measured 136 mm.

The lightest gray skin in the British Museum series was from Victoria Falls. Its crown, nevertheless, had good dark streaks, and those on the breast were unusually heavy. Whether this bird should be assigned to *O. s. griseus* Gunning and Roberts, I cannot say; but it may be that similar coloration is the rule in Southwest Africa. Ogilvie-Grant[1] reported a "remarkably gray example" from Lehutitu, in the Kalahari Desert, and a "very similar" specimen procured by C. J. Andersson in Damaraland. As I have already explained, the dark-colored skin in the British Museum labeled Damaraland is of doubtful origin. Pale gray individuals seem to come mainly from the dry areas of Senegal, the Sudan, Tanganyika Territory, and South Africa from Damaraland to the Orange Free State. I do not mean to imply that they all belong to a single race, for I have not been able to make sufficient comparisons.

Island Races

Subspecies restricted to oceanic islands are likely to receive approval, and it must be said that Count Salvadori took the precaution to have a skin of *O. s. feæ* from Annobon compared with the type of *hendersoni*. The principal characters of *feæ* were its dark color, broad dark stripes on underparts, and smaller light bars or spots on the inner webs of the primaries, toward the base. Wing, 120–125 mm. My examination of a specimen collected by Boyd Alexander confirmed the width of the dark stripes on the breast, but the color of the upperparts was not strikingly different from that of *ugandæ*. *O. s. feæ* must inhabit Annobon in considerable numbers, for Fea collected six specimens in two months. Its peculiarities in color are no greater than those of several mainland races.

[1] 1912, Ibis, p. 400.

Otus socotranus (Ogilvie-Grant and Forbes), which I have not seen, is listed by Mr. Sclater as a race of the African species. From the original description it must be a light gray race, with very pale underparts, and pale rufous tips to the primaries. The wing-length was given as 127 mm.

Variation in Wing-Length

Thus far I have purposely avoided any attempt to justify the recognition of subspecies merely by size. I have taken measurements myself of only about 30 specimens, and it is difficult to gather an adequate series of published data. The extreme dimensions for the species appear to be: wing, 117–143 mm.; tail, 49.5–70 mm. Immature birds may be expected to have shorter wings and tails than adults, and 120 mm. is perhaps the minimum wing-length for an adult. So far as I can determine, there is no appreciable difference in size between the sexes.

Geographic variation in the length of wing is evident, though of course there is some overlapping in measurements. *Otus senegalensis feæ*, according to Salvadori, has the shortest wing, 120–125 mm. *O. s. cæcus* is also short-winged, 121–128 mm. for seven specimens (from Abyssinia, Somaliland, and northern Kenya Colony).

O. s. ugandæ is a large race, with wings in ten specimens 131–143 mm., but it is equalled approximately by *griseus*, *intermedius*, and *latipennis* of South Africa.

Most of the remaining forms are intermediate in size. The wings of three specimens of *O. s. pusillus* measure 126–129 mm., those of three skins of *graueri* 127–130. In four examples of *hendersoni* the wings vary from 128 to 135 mm., and *O. s. senegalensis* appears to have wings of 123–134 mm. *O. s. pygmeus*, if valid, has similar wing-length, 124–136 mm.

Available Names

Eighteen names have been proposed, of which perhaps eleven may yet receive recognition. In order of date, they are:

Scops capensis Smith, 1834, S. Afr. Quart. Journ., 2nd Series, No. 4, part 1, p. 314(South Africa). As explained above, this name cannot be used in the genus *Otus*.

Scops senegalensis Swainson, 1837, 'Birds of Western Africa,' I, p. 127 ("Senegal"). This is the oldest name that can be employed for the species. The type came from the Gambia, is in the Cambridge Museum, and has been examined by Dr. Hartert (1913, 'Vögel Paläarkt. Fauna,' II, p. 982, footnote).

Scops latipennis Kaup, 1852, Jardine's 'Contributions to Ornithology,' p. 110 (Caffraria). Said to be like European species, but with coarser markings, and webs of remiges and rectrices broader. Probably this name may be used in place of *capensis* Smith. In 1862, Trans. Zoöl. Soc. London, IV, p. 223, Kaup added that the bars

on the inner side of the primaries were very indistinct, and that the outermost primary had traces of four light bars on its inner web basal to the emargination, while there were six white and rufous spots on its outer web. Wing, 140 mm.; tail 67.

Ephialtes hendersoni CASSIN, 1853, Proc. Acad. Nat. Sci. Phila., (1852), p. 186 (off Novo Redondo, Angola). A valid race.

Ephialtes latipennis LICHTENSTEIN, 1854, 'Nomenclator Avium Mus. Zool. Berol.,' p. 7 (Kafferland). No description.

Scops pygmea C. L. BREHM, 1855, 'Der Vollständige Vogelfang,' p. 43 (Sennar). A race of the African species, according to Dr. Hartert (1918, Novit. Zoöl., XXV, p. 38). The type is in the Tring Museum. Whether or not it is separable from typical *senegalensis* remains to be proved. For the original spelling of *pygmea* I have to rely on Dr. Hartert, for Brehm's book cannot be obtained here. In later years its was often written *pygmæa*.

Strix scops var. *meridionalis* SUNDEVALL, 1857, Kongl. Svenska Vet.-Akad. Handl., II, No. 3, p. 28 (vicinity of Camdebo, S. Afr., ex Levaillant).

Scops fazoglensis WÜRTEMBERG, 1857, Naumannia, p. 432 (*nomen nudum*). Heuglin, 1867, Journ. f. Orn., p. 293, mentions it as a synonym of *S. zorca africana* Schlegel = *S. senegalensis* Swainson.

Scops zorca africanus SCHLEGEL, 1862, 'Mus. Hist. Nat. Pays-Bas, Rev. Méthod. Coll.,' II, Oti, p. 20 (Cape Colony, and Keren in Bogos). Wing, 4 inches 9 lines to 5 inches. Said by Schlegel to be the same as *capensis*, *senegalensis* and *latipennis*.

Scops masauanus HEUGLIN, 1869, 'Orn. Nord-Ost Afr.,' I, p. 117 (*nomen nudum*. Listed only in synonymy of *Scops zorca africana*).

Pisorhina ugandæ NEUMANN, 1899, Journ. f. Orn., p. 56 (Kwa Mtessa, Uganda). A valid race, as explained above.

Scops socotranus OGILVIE-GRANT AND FORBES, 1899, Bull. Liverpool Mus., II, p. 2 (Socotra). Very probably a valid race.

Scops feæ SALVADORI, 1903, Mem. Acc. Torino, (2) LIII, p. 95 (Annobon I.). A valid race.

Pisorhina capensis intermedia GUNNING AND ROBERTS, 1911, Ann. Transv. Mus., III, p. 111 (Pretoria). Almost certainly valid.

Pisorhina capensis grisea GUNNING AND ROBERTS, 1911, Ann. Transv. Mus., III, p. 111 (Bethulie, Orange Free State). May perhaps prove separable.

Pisorhina capensis pusilla GUNNING AND ROBERTS, 1911, Ann. Transv. Mus., III, p. 111 (Namabieda, Boror, Port. E. Afr.). Apparently a valid race, unusually rufous.

Scops königseggi, MADARÁSZ, 1912, Orn. Monatsber., p. 81 (Shemshir, Blue Nile). Supposedly synonymous with *O. s. pygmeus* (Brehm).

Otus senegalensis cæcus FRIEDMANN, 1929, Auk, p. 521 (Sadi Malka, Ethiopia). A well-marked race, of dark coloration.

Otus senegalensis graueri CHAPIN, described in present paper, p. 4.

CONCLUSIONS

While the exact delimitation of ranges is still impossible in many cases, there is good reason to regard the African scops owl as divisible into at least eight geographic races, in addition to the two described from islands. In certain of the drier areas of the continent the amount of

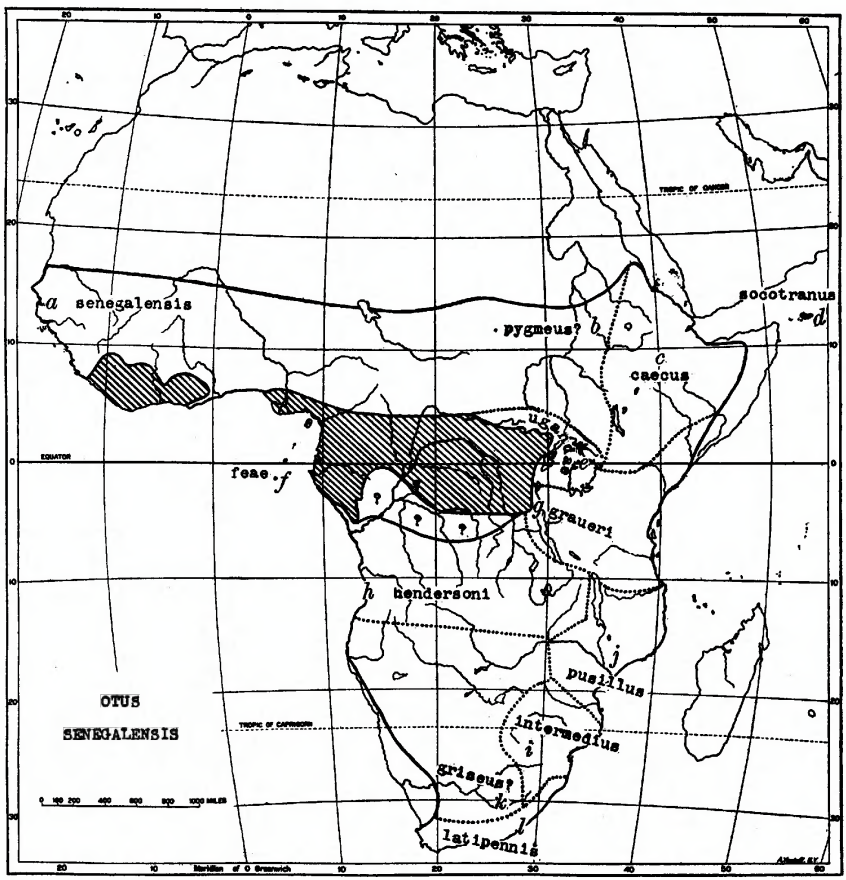

Fig. 1. Distribution of the African scops owl, with possible limits of its races in dotted lines. Type localities of the races which may be recognizable are indicated by letters, as follows: *a, senegalensis; b, pygmeus; c, cæcus; d, socotranus; e, ugandæ; f, feæ; g, graueri; h, hendersoni; i, intermedius; j, pusillus; k, griseus; l, latipennis.*

The shaded areas represent the heavy forests, in which the species is lacking; and there are no records as yet from the region marked ? ?, just south of the Congo forest. Specimens have been taken, however, at Landana and Kisantu. From the dry coastal areas of Somaliland and Southwest Africa, I can find no records.

rufous in the plumage appears to vary rather widely, but not in such a way as to produce clear-cut phases. In a few other regions the rufous or brownish coloration seems to be constant and characteristic. Wing-length is of assistance in the recognition of races, the longest wings being found in Uganda, the northeastern Congo, and South Africa. The shortest wings are those of the birds of Annobon and northeast Africa.

No museum material which I have seen would indicate that individual variation is as great as geographic variation, although I have personally examined about eighty skins. Our specimens of *ugandæ* from the northeastern Congo and Uganda show surprisingly little variability; and the same is true of the two other races known from the Belgian Congo, as far as available material goes. I venture to predict that some races will be recognizable from single specimens, provided that comparative material is available. Others, being more variable, will require several specimens for determination; but this offers no unusual obstacle in the study of racial subdivision.

The next advance is to be expected from ornithologists in the field who will take pains to gather fair series from a single locality or restricted area. Austin Roberts' method was the right one; while his material of some races was scarcely adequate, the question must be approached in that way. My own experience tends to confirm his statements.